

**AMENDMENTS TO THE CLAIMS:**

Claims 1-134. (Cancelled).

**135. (New)** An injectable solution for injection into a body cavity, wherein the injectable solution is obtained by the process comprising the steps of:

dissolving vinyl polymer molecules in a first solution by heating to a temperature above the melting point of the physical associations of the vinyl polymer molecules to form a vinyl polymer solution, wherein the first solution has a Flory interaction parameter (chi value) that is not sufficient for gelation;

contacting the vinyl polymer solution with a second solution in a controlled manner, wherein after the contacting the combination of both solutions has a Flory interaction parameter (chi value) that is sufficient for gelation and thereby forming a theta-gel solution; and

maintaining the theta-gel solution for a time and at a temperature such that it is in a workable state, wherein the workable theta-gel solution can be injected into a body cavity as an injectable viscoelastic solution that gels *in situ* after the injection to form in the body cavity a polymer hydrogel that has physical crosslinks between vinyl polymer molecules, wherein the polymer hydrogel is formed without chemical crosslinkers, irradiation or thermal cycling.

**136. (New)** The injectable solution according to claim 135, wherein the first solution comprises one or more selected from the group consisting of deionized water, and dimethylsulfoxide.

137. (New) The injectable solution according to claim 135, wherein the second solution comprises one or more selected from the group consisting of salts, alcohols, polyols, amino acids, sugars, proteins, and polysaccharides.

138. (New) The injectable solution according to claim 135 wherein the hydrogel is anisotropic in one or more properties.

139. (New) The injectable solution according to claim 135, wherein the contacting comprises mixing.

140. (New) The injectable solution of claim 135, wherein the injectable solution comprises about 1.0 to about 50.0 weight percent polyvinyl alcohol.

141. (New) The injectable solution of claim 135, wherein after the contacting the Flory interaction parameter is 0.25 to 1.0.

142. (New) The injectable solution of claim 135, wherein the vinyl polymer solution contains one or more non-gelling components.

143. (New) The injectable solution of claim 135 further comprising hyaluronic acid.

144. (New) The injectable solution of claim 135 further comprising polyacrylic acid.

145. (New) The injectable solution of claim 135 further comprising a therapeutic agent.

146. (New) An injectable solution for injection into a body cavity, wherein the injectable solution is obtained by the process comprising the steps of:

dissolving vinyl polymer molecules in a first solution to form a vinyl polymer solution, wherein the first solution has a Flory interaction parameter (chi value) that is not sufficient for gelation;

contacting the vinyl polymer solution with a second solution in a controlled manner such that the combination of both solutions achieves a Flory interaction parameter (chi value) that is sufficient for gelation and thereby forming a thetagel solution; and

maintaining the thetagel solution for a time and at a temperature such that it is in a workable state, wherein the workable thetagel solution can be injected into a body cavity as an injectable viscoelastic solution that gels *in situ* after the injection to form in the body cavity a polymer hydrogel that has physical crosslinks between vinyl polymer molecules, wherein the polymer hydrogel is formed without chemical crosslinkers, irradiation or thermal cycling.

**147. (New)** The injectable solution according to claim 146, wherein the first solution comprises one or more selected from the group consisting of deionized water, and dimethylsulfoxide.

**148. (New)** The injectable solution according to claim 146, wherein the second solution comprises one or more selected from the group consisting of salts, alcohols, polyols, amino acids, sugars, proteins, and polysaccharides.

**149. (New)** The injectable solution according to claim 146 wherein the hydrogel is anisotropic in one or more properties.

150. (New) The injectable solution according to claim 146, wherein the contacting comprises mixing.

151. (New) The injectable solution of claim 146, wherein the injectable solution comprises about 1.0 to about 50.0 weight percent polyvinyl alcohol.

152. (New) The injectable solution of claim 146, wherein after the contacting the Flory interaction parameter is 0.25 to 1.0.

153. (New) The injectable solution of claim 146, wherein the vinyl polymer solution contains one or more non-gelling components.

154. (New) The injectable solution of claim 146 further comprising hyaluronic acid.

155. (New) The injectable solution of claim 146 further comprising polyacrylic acid.

156. (New) The injectable solution of claim 146 further comprising a therapeutic agent.